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# TEXTILES FROM THE LATE BRONZE AGE AND THE EARLY IRON AGE IN THE VISTULA AND ODER RIVER BASIN – POLAND

ABSTRACT: This article presents all archaeologically identified finds of the textile evidence dating to the Late Bronze Age and the Early Iron Age from Poland. They have been subjected to qualitative and technological analysis. The identified collection has been divided into individual groups of finds/artefacts to discuss their internal differentiation and to capture the characteristics of changes. The amount of collected evidence allowed for a comparative analysis with the evidence from the neighbouring regions and an assessment of the level of weaving skills. The material shows that there was the leap in technological and qualitative progress occurring in the Early Iron Age, also affecting Poland. This is apparent mainly in the southwestern regions of the country, through a significant increase in the number of medium and good-quality woven products and a clear diversification of textile production. Nevertheless, this level is still significantly lower than that which can be observed in the evidence from the Mediterranean, Austria, Southern Germany or Denmark.

KEY WORDS: textile, weaving production, Late Bronze Age, Early Iron Age, Poland

## INTRODUCTION

Starting from the Neolithic period, weaving was one of the basic branches of home production for prehistoric communities in Europe. The spread of new skills took place gradually, reaching all corners of the continent over time. However, this does not mean that one type of loom or one weaving technique was used everywhere throughout prehistory. Despite its clear universality, this production displayed numerous regional features. They were manifested mainly in preferences regarding the selection of raw materials, processing techniques and finishing. For this reason, in-depth analysis of archaeological finds related to textile production is of such great importance.

Taking into account the above, the aim of this article is to present all archaeologically identified finds of textile materials dated from the Late Bronze Age to the Early Iron Age and to analyse them qualitatively and technologically. This is the period when the Lusatian culture (1300-500 BC), which was part of the Urnfield culture (1300-750 BC), was prevalent in the Vistula and Oder River Basin. By comparing the obtained results with finds from neighbouring regions, it will be possible to recognize the level and nature of this production. The collected source data (Fig. 1)

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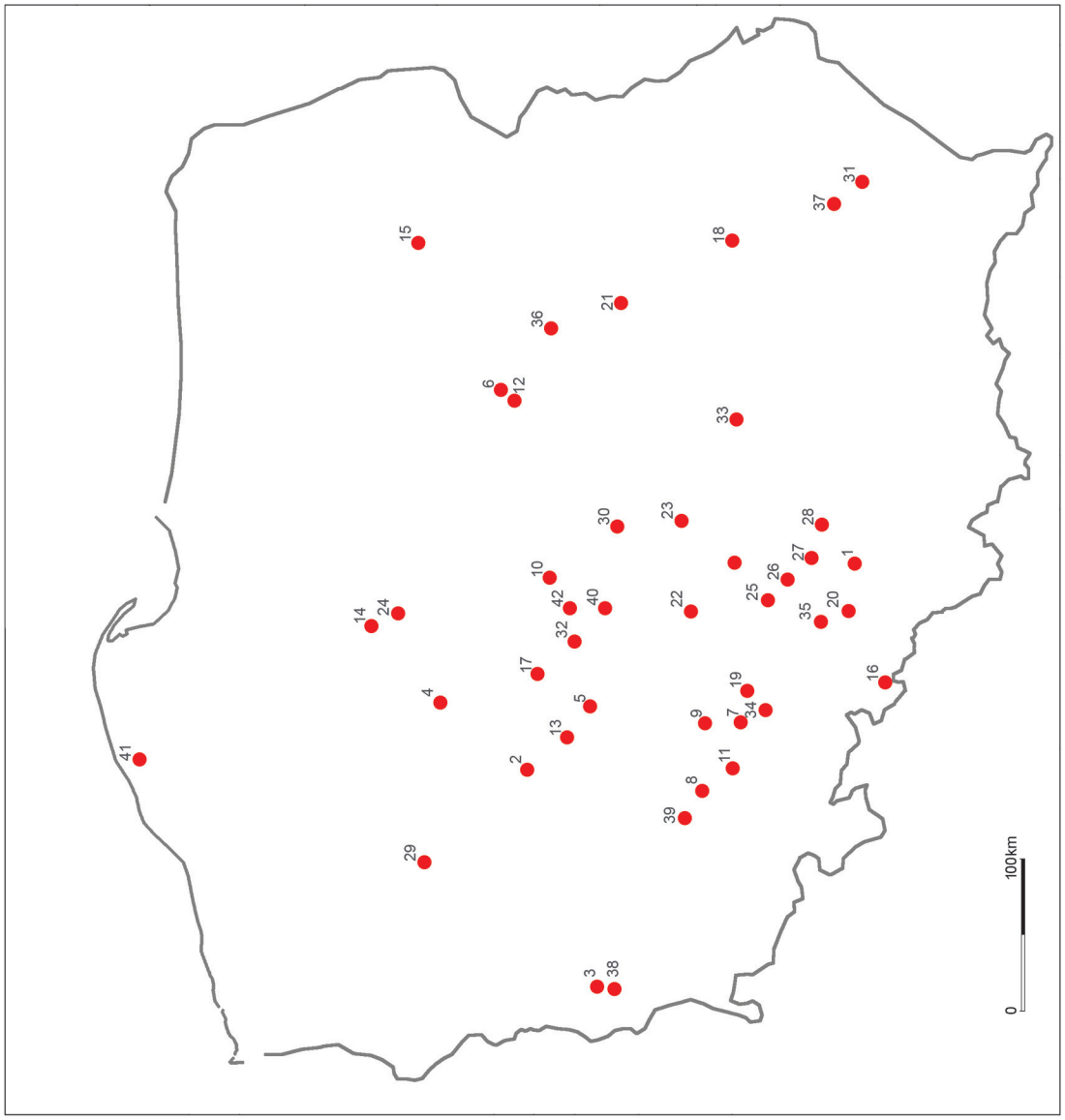


Fig. 1. Map of archaeological sites with textile products since the Late Bronze Age to Early Iron Age from Poland. Prepared by J. Słomska-Bolonek

constitute the most complete set of archaeological finds of textile products from Poland identified so far.

## TYPOLOGICAL DIFFERENTIATION OF SOURCE EVIDENCE

The material presented below has been collected by the author over the last few years during research in libraries, archaeological storerooms and archives in Polish scientific and research institutions (Table 1)[1]. As a result, it was possible to obtain previously unpublished materials, which were subjected to qualitative and technological analysis[2] carried out at the Centre for Research on Old Technologies of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences in Łódź. A textile assessment system was used, taking into account information about the state of preservation, the raw material, the yarn diameter and twist, thread count and special features such as dyeing. Since the analyses of these finds were carried out over a period of over 90 years, information about the authors of the expert opinions and the current location of the material was also included. In total, the collected material includes almost 300 finds (fabrics, tablet woven bands, braided ribbons, felt, sprang, threads and cords), the vast majority of which were fragments of mineralized fabrics or their impressions. It is worth noting that some fabrics, especially those originating from research carried out before the outbreak of World War II, have been completely destroyed or lost. Despite extensive work extending over 60 scientific institutions in Poland, it was not possible to reach all finds of this type. Nevertheless, the scope of the collected data allows for general conclusions, giving this article significant cognitive significance.

## Fabrics/Textiles

### Raw materials

The collection of fabrics, both originally preserved, mineralised and imprinted in earth, metal, glass or ceramic matrix, is represented by 189 archaeological finds of fabrics. They were made from animal and plant materials. In the first case, wool dominated, obtained from farming on an increasingly large scale (Chmielewski 2009, 236). As we know from other European finds, wool could be enriched with human, horse, goat or rabbit hair (Barber 1991, 30; Grömer 2016, 59-61; Bazzanella *et al.* 2005, 157). However, only the presence of deer hair[3] has been suggested so far[4], in products from Łabędy-Przyszówka (Gliwice), Gliwice district (Table 1.20) and Lasowice Małe, Olesno district (Table 1.19). However, the research on these materials had been carried out before World War II by the Berlin researcher W. von Stokar (von Stokar 1938, 50-52; Dobrzańska-Szydłowska, Gedl 1962, 101) and their methodology is unknown.

In the case of plant fibres, it is assumed that flax was commonly used in weaving by Lusatian people. Due to the poor preservation of archaeological fabrics from this period of prehistory the use of hemp, nettle or tree bast cannot be ruled out (Przymorska-Sztuczka 2022, 12-18; Médard 2018, 98) however, there is no direct evidence for this. Certainly, with the development of the agricultural and breeding economy among European prehistoric communities, we can observe a gradual shift in weaving production from plant raw materials in favour of the increasingly common use of wool.

### Techniques

With regard to weaving techniques, the people of the Lusatian circle used tabby weave in their entire history. It was recognized in 97 fabrics. Its derivative form is half-basket weave[5], which occurred at three sites in Domasław, Wrocław district (Table 1.8),

[1] At this point I would like to thank very much all the people who helped me complete this task. This often involved their active involvement. I would like to thank you very much once again.

[2] The study was performed using an Olympus SZ X7 optical microscope (300x magnification) and a Dino-Lite AM4515ZT EDGE digital microscope.

[3] Unfortunately, due to the loss of the material and the analysis without a detailed description, we do not know how and to which threads the deer hair was added.

[4] A re-verification of Scandinavian textiles carried out in recent years, in which the addition of deer hair was also found during pre-war research, has unequivocally ruled out such a solution (Harris 2014, 115-134; Bergerbrant 2007). Consequently, the reports of deer hair in Polish textiles need to be treated with caution, particularly with regard to the evidence that currently has no analogies from other regions and cannot be revisited due to the disappearance of the material.

[5] In older literature that weave was referred to as rep or repp (Maik 2012, 15; Bender-Jorgensen 1992). Currently in the case of fabric, the notation half-basket weave or 2/1 basket weave is used.

Maciejowice, Garwolin district (Table 1.21) and Mąkolice, Piotrków Trybunalski district (Table 1.23). To make fabrics in both of these techniques, the Lusatian people used mainly a warp-weighted loom equipped with one heddle-bar and a shed-rod was required. Although we cannot rule out the use of other types of looms, such as a two beam loom, especially in the north of thy country where Scandinavian influence was visible and where there are no finds of loom weights (Słomska-Bolonek 2021, 95-102). The construction of the warp-weighted loom was known and used for the production of fabrics already in the Neolithic period. This is indicated by the finds of fabric imprints made in tabby, and by loom weights (a structural element of the warp-weighted loom) that were found in the settlements of the Funnel Beaker Culture and of the Linear Pottery Culture in Boguszewo, Grudziądz district (Kirkowski 1994, ryc. 3:2), Rakowo, Głubczyce district (from the collections of The Museum of Opole Silesia in Opole) or from Gwoździec, Tarnów district (Kukułka 2001, 21). In the case of tabby, the weaving was carried out by cross-weaving single warp threads with single weft threads on the loom, and in the case of half-basket weave, in one system we have two threads. Both tabby and half-basket weave are among the basic weaving techniques that have been in use since the emergence of the art of weaving. In Poland, the oldest find of tabby was recorded in the Neolithic settlement of the Lendzielsk culture in Miechowice, Włocławek district (Grygiel 2008, 1014). Half-basket weave, on the other hand, has only been recognized on a Bronze Age Lusatian culture settlement in Maciejowice, Garwolin district (Table 1.21), where it was also preserved in the form of a fabric imprint on grave ceramics. It should be noted, however, that the knowledge of these weaving techniques was confirmed already in the Middle Neolithic (4000-2000 BC), as clearly evidenced by the fragments of fabric from the area of modern Ukraine – Bernasziwka, Jaltuszkiw or Stina (Chmielewski 2009, 272-276; Gleba, Krupa 2012, 402).

A large collection of fabrics of tabby weave with the lowest threads count not exceeding 5 threads per cm has been preserved as fabric imprints on a cinerary urn from the cremation cemetery in Maciejowice, Garwolin district (Table 1.21), as well as a single find from Lasowice-Małe, Olesno district (Table 1.19). There is also a fabric imprint from the settlement in Biskupin, Żnin district (Table 1.4). As the author of the expert report on the Maciejowice collection points out, these imprints were made at the stage of their production (Maik 2014, 411). This may mean that such textiles were intended for work carried out within households. However, this hypothesis is not supported by evidence from the necropolis in Lasowice Małe (Table 1.19), whose thread count is only 3 threads per cm in one system and 4 in the other. It was made of thin yarn with a diameter of 0.30-0.40 mm, which gave the product a very open structure. It is possible that it was deliberately made as a "net", constituting a kind of headgear, as suggested by its location in the grave. It could have also been subjected to strong stretching and have become loose as a result. Nor can it be ruled out that alternating wool and plant material was used. The latter, as a result of being buried for a long time, could have completely degraded, thus forming a loose structure of the product. In such a situation, it would be possible to observe the characteristic deflections of the threads left by the degraded plant fibre in the course of laboratory research. However, such a situation is not mentioned by the author of the pre-war examination, and the material cannot be studied again due to the loss of the archaeological evidence.

Very good quality textiles[6] with a high number of threads count, made in a tabby weave exceeding 15 threads per cm, were discovered in the cemetery in Kietrz, Głubczyca district (Table 1.16), Godziętowy, Ostrzeszów district (Table 1.9), Sieniawa-Pigany, Przeworsk district (Table 1.31), Świbie, Gliwice district (Table 1.35) and also in Domasław, Wrocław district (Table 1.8). Without a doubt, their parameters exceed the average for the period in question, which ranges from 8 to 14 threads per cm, which is typical for products of medium and good quality (Grömer 2016, 115). An explanation for the presence of delicate fabrics in the studied collection should most likely be sought in the qualitative increase in Early Iron Age weaving and in the specificity of the sites from which they come. They were discovered in necropolises showing strong connections with the Hallstatt culture (Maik, Rybarczyk 2016, 25-44; Gediga 2013, 384, fig. 1).

An undoubted surprise for Polish textile archaeologists was the occurrence of fabrics made in a 2/2 twill in the material from the Early Iron Age, which were found in Domasław, Wrocław district (Table 1.7)

[6] The qualitative assessment was borrowed from a study of the evidence from the Hallstatt salt mine (Grömer, Kern, Reschreiter, Rösel-Mautendorfer 2013, 63, fig. 20).

and Bnin, Poznań district (Table 1.2). Before their discovery, the oldest twill fabrics were dated to the Roman period (Maik 1977, 77-145). Twills are among the more advanced weaving techniques because they require the use of a loom with an elaborate structure. The weaving loom had to be equipped with additional heddle-bars,[7] as the warp was divided into four sets and not – as in the tabby weave – into two (Maik 2012, 82). The oldest piece of fabric made in this way dates to 1400 BC and was discovered at Malanser in Lichtenstein[8] (Bazzanella *et al.* 2003, 273), though in basketry twill is known from finds dating to the Middle Neolithic (Grömer 2016, 130). Subsequent finds were identified in deposits from the Bronze Age in Hallstatt and from the Late Bronze Age in Dehnsen in Germany (Krüger 1924, 70-71). However, this technique did not become common until the Early Iron Age (Rast-Eicher 2012, 383-386; Gleba 2012, 227-229, 232; Banck-Burgess 2012, 139-150).

The 2/2 twill fabrics from the cemetery in Domasław, Wrocław district (Table 1.8) occurred in cremation burials, in the immediate vicinity of iron grave goods. To produce them, yarn with a diameter of 0.20 to 0.80 mm was used, with a thread count of 11 to 20 threads per cm (Maik, Rybarczyk 2016, 37-39). These fragments are among the best quality textile products in the discussed collection and constitute the oldest, reliable examples made in a 2/2 twill from Poland (Maik, Rybarczyk 2015, 83-94). There are many indications that these are imports, the product of trade between the local elites and a population on the Danube. They may also be the remains of clothing of the newcomers from the Hallstatt culture, who came to Silesia to create a new settlement enclave there (Gediga 2010, 187-218; Gediga 2013, 283-393). However, local production cannot be conclusively ruled out. It may have been carried out by new settlers or by local people of the Lusatian culture who mastered new weaving skills from newcomers from the South (Maik, Rybarczyk 2016, 35).

When assessing the technological level of weaving in the Bronze Age and the Early Iron Age, it is necessary to take a closer look at the technical aspects of preserved fabrics, such as the twist direction and diameter of the threads. In the archaeological evidence obtained so far, the same twist direction of threads in the warp and the weft is clearly visible. It occurred in 96 fabrics, of which 23 were s-twist and 73 z-twist. Only one fragment of half-basket weave from Domasław, Wrocław district had different twists of yarn in the warp and weft. This arrangement made the fabric appear smoother, which is an effect of the play of light (Chmielewski 2009, 234). The lack of more finds of this type suggests that the population in this period of prehistory did not experiment in this area. Neither is it apparent that the direction of the thread twist is a geographically-specific trait. It is probably related to the skills of local spinners who prepared threads in the one way that they had been taught. It was also not observed that the twist of the yarn was in any way related to the raw material used. This clearly differs from the observations made for the later textile evidence of the Wielbark culture, in which tabby weave fabrics with s-twisted yarns were made only from plant fibres (Maik 2012, 93).

The yarn diameter was similar in both systems. The smallest values were around 0.20-0.40 mm. They were identified, for instance, in the material from Stare Kolnie, Opole district (Table 1.34) and Świbie, Gliwice district (Table 1.35). At the other end of the scale there are the coarser products with a yarn diameter of 1.00-1.20 mm, which could even reach 2.00 mm. For example, such threads were found in Ruda Pabianicka, Łódź district (Table 1.30) or in Świbie, Gliwice district (Table 1.35). Only at one site in Mąkolice, Piotrków Trybunalski district (Table 1.23) was a clear difference between yarn diameter in the two systems noticed. Such a solution made it possible to manipulate the texture of the fabric. However, the number of products with such features indicates that the population in the period discussed here did not try to achieve such effects.

An interesting discovery related to fabrics is the find of fringes which was preserved in the fill of Grave 125 in the cemetery in Świbie, Gliwice district (Table 1.35). The simple fringe was made of three warp threads braided together. They are most likely the fragment of the finishing border of one of the fabrics found there. This is supported by the fact that both these fringes and the fabric were most likely made of dyed yarn[9]. This means that these items are the old-

[7] For a 2/2 twill, the number of heddle-bars required is three, using a fixed shed-rod.

[8] The imprint is barely legible.

[9] The colour diversity of the product was observed during visual inspection and analysis using an optical microscope. The samples were sent to the Gdańsk University of Technology, where the examination was conducted by dr. hab. M. Śliwka-Kaszyńska with the use of LC-MS. However, the presence of dyes could not be confirmed due

est finds from Poland indicating the use of dyed fibres in the weaving process. Due to the lack of other finds indicating knowledge of the dyeing technique and given that dyeing is a difficult process, requiring a great deal of experience and knowledge of chemical principles, it can be presumed that the product is of foreign origin. This may also be suggested by the place of discovery, where numerous imports were recorded (Michnik, Zdaniewicz 2014, 29-31; Michnik, Dzięgielewski 2022, 50-113).

There were many diverse methods of finishing fabrics in the period of prehistory discussed here. The bottom edge could be finished with fringes, which were made by tying, braiding, twisting or interlacing. Edges were also finished by adding cord, braids, tablet-woven border, sewing the warp threads into the fabric or leaving them to hang loose (Gleba, Mannering 2012, 13).

## Tablet Woven Bands

These are narrow fabric bands forming a kind of tape or ribbon. In the evidence from the Lusatian culture, we only have a few fragments of them, dated to the Early Iron Age. They have been identified in cemeteries in Domasław, Wrocław district (Table 1.8) and Zakrzew, Sieradz district (Table 1.40). In the case of the finds from the latter site, it was determined that they had been made using 21 two-hole tablets (Maik 2005, 227-228). It is difficult to determine whether they were made on a tablet loom or in a twisting technique, which can create this similar structure, especially for two threads per tablet (Collingwood 1996, 193-200). Certain technological features, such as the small width of products from Teklin, Otwock district (Table 1.36) may indicate that these are also remains of bands. The finds described above should be considered as the oldest finds of tablet woven bands from Poland. The earliest[10] tablet woven border derive from a tumulus in Schwarza, in Germany dated to the Middle Bronze Age (Farke 1993, 109-112) and the earliest plausible evidence of weaving tablets border derives from Abri Mühltal in Germany, dating to 1400-1075 BC, that were found along with other textile tools (Grömer, Stöllner 2009, 121). Undoubtedly, the full development of narrow weaving bands occurred thanks to the people of the Hallstatt culture, whose products represented a very high technological level. It is enough to mention the brilliant products from Hallstatt (Grömer *et. al.* 2013, 87-88; Grömer *et al.* 2021, 115-125) and one from the salt mine in Hallein-Dürrnberg (Ræder Knudsen, Grömer 2012, 92; Grömer 2013, 72-74; Hundt 1960, 126-150; Hundt 1967, 38-65), which were made in tablet-woven 3/1 twill, with the use of dyed threads. Equally impressive textile products of this type have been discovered in Eberdingen-Hochdorf, Hohmichele, Glauberg, Altier in Germany, in Apremont and Maridie from France or in Verucchio, Sante Paloma and Sasso di Furbara from Italy (Barber 1991, 119; Banck-Burgess 1999, 65-82; Ræder Knudsen 2012, 254; Ræder Knudsen, Grömer 2012, 92-97; Gleba 2014, 145-169; Rast-Eicher, Vanden Berghe 2015, 117-124; Peek 2018, 361-434).

## Braided Ribbons

They appeared in the form of 39 fragments in the cemetery in Świbie, Gliwice district (Table 1.35). They are approximately 1.5 cm wide. On average, 4-6 plant fibre threads with a diameter of about 0.50-0.60 cm were used to make them. Their presence was recorded among grave goods along with bronze decorations, which were elements of headgear (diadems) or necklaces.

In Poland, the first evidence of familiarity with nonwoven fabric comes from the Stone Age (Słomska 2018, 567-568). However, their simplicity and versatility of use meant that they were used in every period of history. Nonwoven fabric were used in transport, gathering and hunting (Moszyński 1967, 329-336) to produce snares, bowls, sieves and ropes, as well as pieces of clothing such as shoes and headgear (Targońska 1996, 11-18; Wiesner *et al.* 2013, 111, fig. 7).

A similar braiding technique was used to produce ribbons from Świbie, Gliwice district (Table 1.35). They were made of thick threads that were plaited together without the use of additional tools. Only narrow products could be manufactured in this way.

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to the excessive saturation of the textile product with metal oxides.

[10] A particularly impressive product made using 84 tablets was excavated from Tumulus 2 in Novosvobodnaya in a settlement and cemetery under the northern slopes of the Caucasus (Shishlina *et al.* 2003, 333-334). However, in the opinion of some textile researchers, such as M. Gleba, K. Grömer or A. Ulanowska, the results of these studies are highly questionable and require repeated verification.

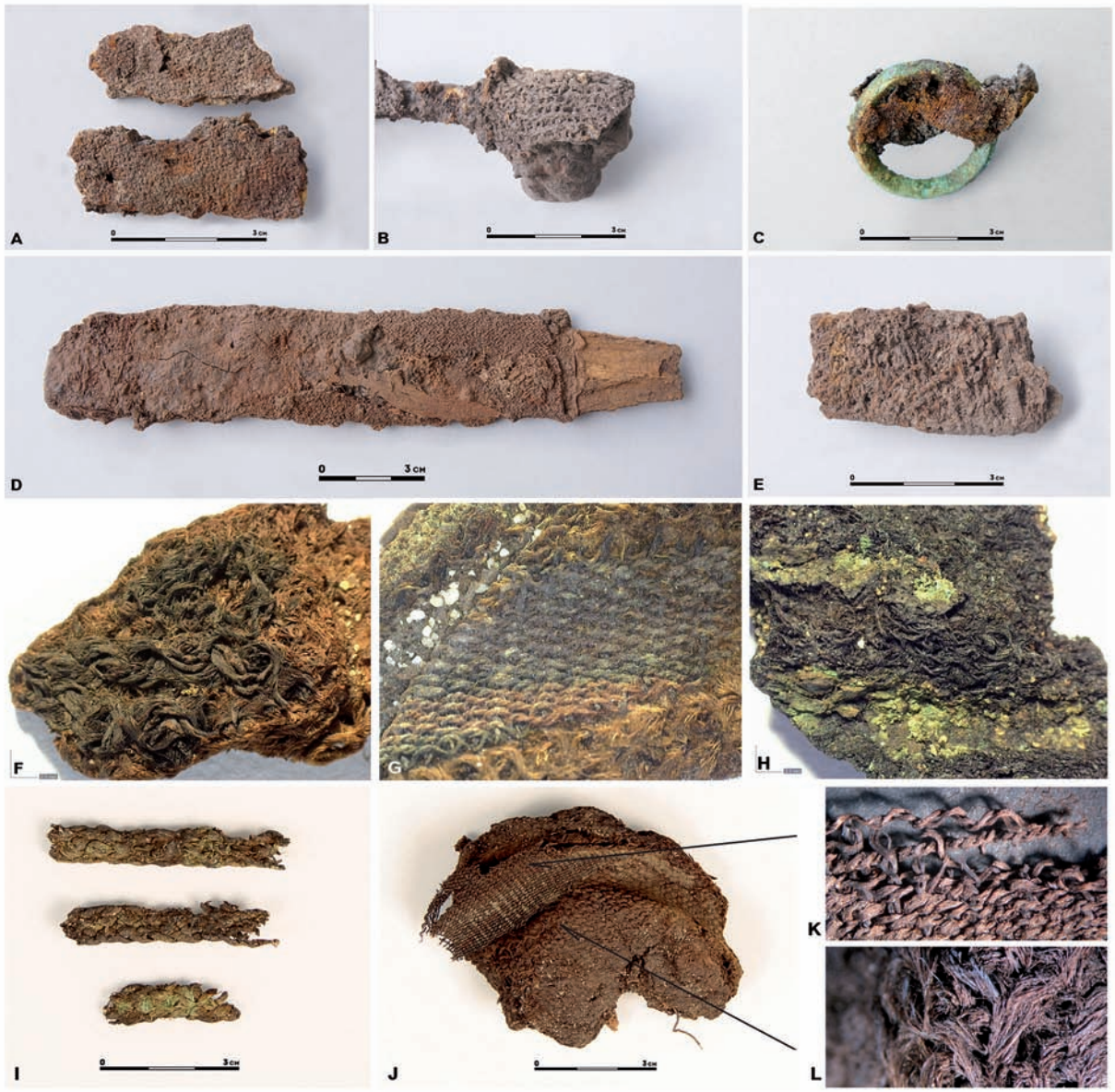


Fig. 2. A – Domasław, Wrocław district. Twill 2/2 fabric (Tab. 1.8.3); B – Domasław, Wrocław district. Tablet woven band (Tab. 1.8.14); C – Domasław, Wrocław district. Twill 2/2 fabric (Tab. 1.8.2); D – Domasław, Wrocław district. Twill 2/2 fabric (Tab. 1.8.20); E – Domasław, Wrocław district. Tabby fabric (Tab.1.8.19); F – Świbie, Gliwice district. Fringe (Tab. 1.35.28); G – Świbie, Gliwice district. Tabby fabric, probably made of dyed yarn (Tab. 1.35.24); H – Świbie, Gliwice district. Sprang (Tab. 1.35.19); I – Świbie, Gliwice district. Braided ribbon (Tab. 1.35.109); J – Świbie, Gliwice district. Two tabby fabrics (Tab. 1.35. 20-21); K – Świbie, Gliwice district. Fabric no. 20 close-up (Tab. 1.35.20); L – Świbie, Gliwice district. Fabric no. 21 close-up (Tab. 1.35.21). Photo by J. Słomska-Bolonek

For this reason, braiding was often used to strengthen the edges of fabrics (Grömer *et al.* 2015, 43-44), to finish (Médard 2010, fig. 101d; Schlabow 1976, 71, 117, 120) or to create elements increasing the flexibility of weaving products (Bazzanella *et al.* 2005, fig. 6; Grömer *et al.* 2015, 44). No other products of this type from Poland are known. The closest analogy is provided by two Early Iron Age ribbons from the Hallstatt salt mine (Grömer *et al*. 2013, 570, 573).

## Felt

Felt is a dense and compact mass of tangled rather than interwoven animal fibres. It should therefore be emphasised that it is a nonwoven fabric (Michałowska 2006, 90). Felt is perfect for insulation because it is dense and strong. It is formed in the course of a fulling process, which involves connecting the raw material into a cohesive fabric through exposure to high tem-

perature, moisture and pressure. The easiest way to achieve it was to soak and knead sheep wool in warm water. This process led to individual wool fibres being entangled, which produced a dense and thick fabric. Since this product was very durable and had water-resistant properties, fabrics that were intended to be given such properties were also finished in a similar way.

In the evidence discussed, the presence of felt was recorded at the necropolis in Łabędy-Przyszówka, Gliwice district (Table 1.20). In three burials, felt was found around the skulls, either directly attached to them or retained on bronze objects located nearby. Their technical parameters, such as size, diameter of the threads or colour, are unknown, and it is not possible to repeat the examination due to the loss of the evidence (Dobrzańska-Szydłowska, Gedl, 1962).

Considering the issue of the presence of felt in Polish lands in the Bronze Age and the Early Iron Age, it is worth analysing the spread of the familiarity with the process of its production by the prehistoric population. The oldest felt fragment comes from the 3rd millennium BC from Beycesultan in Anatolia (Lloyd, Mellaart 1962, 40-45). The oldest European felt finds, dated to the Early Bronze Age, come from Wiepenkathen and Unterteutschenthal in Germany (Barber 1991, 217-218; Schlabow 1959, 118-120). However, these are isolated discoveries that were not followed for the next few hundred years (Barber 1991, 217). However, many fabrics discovered in the Hallstatt salt mine had characteristics similar to felt but they are fulled textiles (Grömer *et al.* 2013, 245-315). It was so intense that in the case of some fabrics it was difficult to read the structure of the fabrics (Grömer 2016, 210). However, these were textile products used in the mine, so the fulling process most likely occurred accidentally as a result of their intensive use. We can also recognize similar products in the material from Unterteutschenthal in Germany (Schlabow 1959, 118-120), Castionedei Marchesi in Italy (Bazzanella 2012, fig. 8.12), Björlöv in Sweden (Franzén *et al.* 2012, 354-355, table 17.1) or in Danish material from the Bronze Age and the Early Iron Age (Mannering *et al.* 2012, 97).

Based on the examples given above, can we conclude that the people of the Lusatian culture mastered the skill of producing felt? In my opinion, we cannot. Nevertheless, the characteristics of the products from Łabędy-Przyszówka, Gliwice district, must have led W. von Stokar to assess them in this way. By reason of the loss of the evidence, this question will probably never be fully resolved. It seems more likely that the textile products preserved in Silesian burials were the remains of fabrics that, as a result of intentional or accidental processes, acquired characteristics similar to felt.

## Sprang

Sprang is one of the textile products that is very rarely found in archaeological evidence. The technique of making sprang involved interlinking, interlacing or intertwining adjacent threads of only one system. They were always arranged parallel to each other, individually or in a group (Collingwood 1974, 31-32). Any structure with a fixed top and bottom element could serve as a sprang frame (Hald 1980, 255, fig. 256). An additional element was used in the middle area, blocking the thread from unravelling. It could be a thread, a cord or a stick. The pattern in the mesh technique was produced by creating interlaces that formed meshes both in the top and bottom areas of the frame. Their number was almost unlimited, because each time one could choose to change the direction, order and number of the twists of the thread (Collingwood 1974, 31). What distinguishes sprang from the net is its high flexibility, lack of knots and production process not involving the use of a shuttle or a needle (Ulanowska 2013, 64). This technique allows the production of textiles with high elasticity that were good material for a hat or hair net.

In the analysed collection, sprang was found in the cemetery in Świbie, Gliwice district (Table 1.35), in Konin-Grójca, Konin district[11] (Table 1.17) and in the hoard from Rosko, Czarnków-Trzcianka district (Table 1.29). Only the material from the first site has survived. It has been preserved in three fragments, one of which is currently considered to be lost. Since it has not been subjected to appropriate technological analyses, we know little about it (Łaszczewska 1966, 33, fig. 10). The extant two were preserved next to wood in the Graves 124 and 136. Wool yarn with a diameter of 0.40 and 0.30 mm twisted in s-direction was used to make them. The same diam-

[11] The interpretation of some of the material from Konin-Grójca, Konin district (Sikorski 2001, 377-389) is, in my opinion, highly doubtful. Yarn measurements made on the basis of imprints reach an unprecedented value of 0.05-0.07 mm in this period, which has no equivalents in any European evidence from this period.

eter of thread was also used to make the sprang from Rosko, Czarnków-Trzcianka district (Sikorski 2006, 153-156). It was found in two places, in the form of imprints on a bronze axe.

Sprang was produced already in the Neolithic, as evidenced by the finds from Pestenacker (Möller-Wiering 2012, 129) and Rietzmeck in Germany (Barber 1991, 123). However, they are still the subject of debate and not all researchers agree with this interpretation (Bender Jørgensen 1992, 51; Collingwood 1974, 37). Certain finds of sprang, dated to 1600-1300 BC, come from Harrislee and Thürkow in Germany (Möller-Wiering 2012, 130) and from 1300-1100 BC in the Danish burials from Borum Eshöj and Skrydstrup (Hald 1980, 251-252). There is also a find of a hair net discovered in the Haraldskær swamp in Vejle in Denmark (Collinwood 1974, 38) and the hat or hood from a peat bog in Bredmose, also in Denmark (Hald 1980, 28-30, 251-252). One of the most interesting European finds of this type comes from Poland. It was discovered in the cemetery in Czarnówko, district Lębork, in Grave R380 dated to the 2nd-3rd century AD. Its uniqueness stems from the fact that it was made from silk of Chinese origin (Maik 2018, 155-158).


Fig. 3. A – Zakrzew, Sieradz district. Tablet woven band (Tab. 1.40.1) (after Krzyszowski 2005, 129, ryc. 5); B-C – Będzin-Łagisza, Będzin district. Thread and its enlargement (Tab. 1.1.1); D – Kosin, Kraśnik district. Imprint of tabby fabric (Tab. 1.1.1) (after Miśkiewicz, Węgrzynowicz 1974, 190, ryc. 30); E – Konin-Grójca, Konin district. Presumed sprang close-up (Tab. 1.17.2-3) (after Sikorski 2001, 383, ryc. 2.a); F – Godziętów, Ostrzeszów district. Tabby fabric (Tab. 1.9.1); G – Maciejowice, Garwolin district. Imprint of tabby fabric (Tab. 1.21.6) (after Dąbrowski, Mogielnicka-Urban 2014,33, ryc. 143.6); H – Teklin, Otwock district. Tabby fabric or tablet-woven band (Tab. 1.36.1) (after Węgrzynowicz 1973, 29, ryc.7); I – Żelazo, Słupsk district. Cord (Tab. 1.41.1) (after Krzysiak 2006, 208, ryc. 5.9)

### Threads and Cords

The textile products from the Late Bronze Age and the Early Iron Age also include threads and cords. In the collected material we can find 42 such fragments. In most cases, these are simple products, made of a single or plied thread. The strands were twisted both in s and z-direction. They were mostly made of bast-fibres, sheep wool and animal intestines or tendons, which were identified in the material from Pawełki, Lubliniec district (Table 1.26) and Opatów, Kłobuck district (Table 1.25). Their diameter was usually 0.40 to 1.20 mm, although thicker products with a diameter of up to 2.00 mm were also identified in the material. Cords were recorded in the hoard of iron items from Żelazo, Słupsk district (Table 1.41), in the cemetery in Zakrzew, Sieradz district (Table 1.40), in Żdżenice, Turek district (Table 1.42), in Ruda Pabianicka, Łódź district (Table 1.30), in Bieszków, Żarsk district (Table 1.3) and in a settlement in Mirakowo-Grodno, Toruń district (Table 1.24). The finds from Zakrzew were made of four threads pied together, creating a product with a diameter of 2.20-2.40 mm. The thickest cord comes from Bieszków and is 3.60 mm thick.

In my opinion, the location of the threads in the grave and the way they were made exclude the possibility that they constitute elements of fabrics. Nevertheless, they indicate the birth among the Lusatian population of the first composite objects where metals and fabrics were connected to each other. This is well evidenced in the production of headbands, also called diadems. Decorative elements of bronze were sewn to the base of the headband that was made of fabric, braids, ribbons or a strip of leather (Słomska, Antosik 2018, 58). Currently, it cannot be unambiguously established whether this was the only way that threads were used. In Polish material there is no archaeological evidence suggesting the cutting or stitching of other pieces of clothing, which would indicate the use of tailoring like that which we can see in material form Hallstatt salt mine (Rösel-Mautendorfern 2011, 31-76).

## DISCUSSION

All the textiles products presented above almost 300 finds from 44 sites. The size of this corpus of information allows for a comparative analysis with the evidence from neighbouring regions and an assessment of the level of the weaving skills of the people inhabiting Polish lands in the Late Bronze Age and the Early Iron Age.

Textile products from the sites at Hallstatt, most of which are organically preserved, constitute the largest collection from the discussed period of prehistory and therefore constitute a natural point of reference for our finds. The earliest material, dated to the Middle to Late Bronze Age, consists of more than 100 textile fragments, made of sheep wool and flax, with threads mainly 0.60-1.20 mm in diameter, which were twisted in both directions (Grömer 2012, 30-31). Tabby dominated, with a low thread count of 4-6 threads per cm, although half-basket weave, rep selvedge and the first twill fabrics also appear in this material (Grömer 2013, 60-61). Only individual finds display high quality workmanship. An example is a rep selvedge with a thread count of 24 warp threads and 14 weft threads per cm (Grömer 2012, 31-32). In addition, the first few dyed and patterned products appear. Textiles of similar quality also occurred in other Austrian sites dating to the Bronze Age, such as the cemeteries in Vösendorf and Franzhausen, the settlement in Trasdorf or the copper mine in Mitterberg/Hochkönig (Grömer 2012, 30).

Rapid qualitative changes in the weaving craft took place in the Early Iron Age and coincided with the development of the Hallstatt culture. There are more than 350 finds of fragments of wool fabrics, most of which are dominated by 2/2 twill and its variants (Grömer 2012, 42-43). Mainly single yarn was used, twisted in both directions, with a diameter of less than 0.50 mm. More than half of the products have a high thread count of 10-15 threads per cm. Moreover, a large group of finds are products of very good quality, with a thread count of up to 40 threads per cm and a yarn diameter of 0.10-0.30 mm (Grömer *et. al.* 2013, 61-62, 367, 443). Significantly lower threads count parameters are observed in tabby and half-basket weave fabrics, the thread count of which does not exceed 20 threads per cm, the threads being 0.80-1.40 mm in diameter. What is particularly characteristic is the significant increase in the number of patterned products made of dyed raw material or yarn. They were decorated with geometric motifs, analogous to those observed on ceramics and metal products (Gralak 2017, 49-65). Like in Hallstatt (Grömer *et. al.* 2013, 71-73), also in La Téne period Hallein-Dürrnberg (Hundt 1960,126-150; Hundt 1967, 38-65; von Kurzynski 2002, 1-23), dozens of colourful fabrics, selvedges and tablet-woven bands were discov-

ered. Colour became a characteristic feature of local crafts and as such, an indication of the development of fashion and design. Similar technological parameters are also displayed by fabrics from other sites in the region: Mitterkirchen, Uttendorfim Pinzgau, Führholz, Gilgenberg, Mattsee, Schleedorf-Mölkham, Schusterwald or Berg/Attergau (Grömer 2012, 42). As we can see, the weaving craft of the Early Iron Age in the Middle Danube region was characterised by a much higher quality of production than that which existed at the same time in the Vistula and Oder River Basin.

From the territory of the modern Czech Republic and Slovakia, we have a small number of finds of textile products from the discussed period. Most of them are mineralized, since, just like in Poland, they are found on metal elements of grave goods. On the basis of this evidence, it seems that in the Bronze Age mainly simple fabrics were produced, in tabby, characterized by a low thread count of 4-7 threads per cm (Vykouková *et al.* 2007, 2016-219). Starting from the Late Bronze Age, an increase in the quality of plain weave fabrics is recorded. They were made of plant and animal fibr threads that were thinner than before. This allowed fabrics with twice the thread count than before to be made. Products of this type were discovered, for example, in the cemetery in Bylany (Slabina, Vykouková 2006, 94-95) or in Staré Město (Hrubý 1968-1969, 51-58). The fabric from the latter site was of higher quality because it was made with a thread count of 18 and 24 threads per cm in the warp and in the weft (Hrubý 1968-1969, 51-58). Archaeological evidence from this period also includes some products in a 2/2 twill (Kostelníková 1990, 115; Belanová Stolcová 2012, 310).

A more complicated state of affairs occurred in modern Germany. This area was strongly influenced by the Nordic circle and the Hallstatt culture. In the Bronze Age, tabby, half-basket and rep selvedge dominated there, with a low thread count of 3-8 threads per cm and variable twist direction of the yarn (Möller-Wiering 2012, 130). The first twill textiles were produced there in the Late Bronze Age, which is confirmed by finds from Dehnsen (Krüger 1924, 70-71), Nebel (Ehlers 1998, 272-278) or Gevelinghausen (Hundt 1969-1970, 257-258; Möller-Wiering 2012, 130).

In the Early Iron Age, the region was divided into north-central and southern parts[12]. In the first area, production was still focused on plain weave fabrics, with an average density of 10-18 threads per cm, which classifies them as medium and good quality products (Möller-Wiering 2012, 132). There are also other products in a 2/2 twill, which were discovered in Damendorf (Schlabow 1976, 84), Almdorf (Bender Jørgensen 1986, 231), Sonnenberg and Wretleben (Bender Jørgensen 1992, 227). Weaving, on the other hand, developed more rapidly in the south, due to the influences from the Hallstatt culture. The finds are dominated by wool products in a 2/2 twill, with plied threads in the warp and single yarn in the weft (Möller-Wiering 2012, 131). During this period, tabby clearly lost its importance and was mainly used in textiles made from plant raw materials (Bender Jørgensen 1992, 55). The uniqueness of the changes taking place in the weaving of this area is also evidenced by a spectacular find from the tomb from Eberdingen-Hochdorf (Banck-Burgess 1999, 82-84). In the filling of the burial chamber, an intact set of textiles used in the funeral rite was found. Most of them were made in a 2/2 twill, although there are also fragments in a tabby and a 2/2 diamond twill (Banck-Burgess 2012, 141). Dyed yarn was used for production of the fabrics, selvedges and tablet bands, which allowed products with unprecedented designs to be obtained (Banck-Burgess 1999, 82-101).

Comparing Polish textile finds with the evidence from the neighbouring areas and comparing them with the evidence dated to the earlier and later periods of prehistory, it is possible to see their common features, but also progressive changes and directions in the flow of knowledge and skills. In the entire analysed area of Central Europe, weaving in the Bronze Age was at a rather low level of advancement; however, already at that time there were symptoms of the prehistoric weaving revolution waiting to happen. The share of wool products in the bulk of textile products is increasing. The predominant weave is tabby, with a low thread count, produced from fairly thick threads. The number of local finds from this period of prehistory is small, and poor or medium quality products prevail among them. It seems therefore that in this period weaving production benefited from local knowledge passed down from generation to generation, with only minor refinements. This is clearly manifested in spinning customs, as a result of which yarn was prepared only in s-twist or z-twist within one community. This

[12] The Danish researcher L. Bender Jørgensen divided the territory of Germany into three geographical zones: northern, central and southern (Bender Jørgensen 1992, 51-53).

procedure did not depend on the type of raw material used, but only on the traditions of local spinners.

## CONCLUSIONS

A leap forward in technology and quality in the Vistula and Oder River Basins occurred in the Early Iron Age as a result of the development of the farming-stockherding subsistence enabling the supply of sufficient raw material (Urban 2019, 186-187). Direct contacts with the people of the Hallstatt culture, which was at the time the centre of familiarity with weaving production in Central Europe (having direct contacts with main weaving centres in the Mediterranean), were also not without significance. There is a significant increase in the number of fabrics with high thread count, among which tabby fabrics invariably dominate. There is a clear diversification of textile production, manifested by the presence of plaited braids, tablet woven bands, sprang or products with characteristics of felting. The highest density of their occurrence is recorded in the southwestern parts of the country. They are also accompanied by very high-quality fabrics made of dyed threads as well as textiles in a 2/2 twill. Their presence is mainly concentrated in Silesia, which received the quickest impulses from the Alpine zone and the Mediterranean world. In the rest of the country, changes took place much more slowly, manifesting themselves mainly in the improvement of the quality of produced threads and the increase in the density of tabby fabrics. The observed changes in weaving production are also manifested in an increase in the number of found loom weights and their strong differentiation in terms of dimensions, weight and workmanship (Słomska-Bolonek 2019, 89-99).

Based on the above, it can be concluded that weaving handicraft developed significantly in Poland since the Early Iron Age. As a result of impulses coming from the main cultural centres of Europe at that time, the local population acquired knowledge and skills that allowed them to produce textiles and weaving products of much better quality than before. Nevertheless, this level is still clearly lower than that which can be observed in the evidence from the Mediterranean Basin, Austria, Southern Germany or Denmark. It also shows strong regional differentiation, clearly concentrating in the south-western regions of the country.

Table 1. Catalogue of textile finds from the Late Bronze Age and Early Iron Age from Poland

| No. | No. | Type of find | Preservation | Material | Weave | Warp twist | Weft twist | Thread count per cm on warp | Thread count per cm on weft | Warp thread diameter (mm) | Weft thread diameter (mm) | Found in | Preserved on | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Będzin-Łagisza, Site 1, Będzin district**<br>biritual cemetery. HaC<br>Galasińska-Hrebendowa 1989<br>author of the analysis: Słomska-Bolonek J.<br>material in Upper Silesian Museum in Bytom | | | | | | | | | | | | | |
| | 1 | thread | mineralized | plant | - | z | - | - | - | 0.65 | - | Grave 329 | on the bones | - |
| 2 | **Bnin, Site 2B, Poznań district**<br>settlement. HaC-D<br>Fogel, Sikorski 2006<br>author of the analysis: Sikorski A.<br>material in Faculty of Archaeology of the Adam Mickiewicz University in Poznań | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | twill 2/2? | - | - | - | - | - | - | - | on a clay casting mold | - |
| | 2 | fabric | imprint | - | - | - | - | - | - | - | - | - | | |
| | 3 | fabric | imprint | - | - | Z/2? | Z/2s? | 12 | 10 | 0.60 | 0.74 | - | | |
| | 4 | fabric | imprint | - | - | - | z | - | - | - | - | - | | |
| | 5 | fabric | imprint | - | - | Z/2? | Z/2? | 12 | 10 | 0.66 | 0.92 | - | | |
| | 6 | fabric | imprint | - | - | - | - | - | - | - | - | - | | |
| | 7 | fabric | imprint | - | - | - | - | - | - | - | - | - | | |
| | 8 | fabric | imprint | - | - | Z/2? | Z/2? | 12 | 10 | 0.68 | 0.86 | - | | |
| | 9 | fabric | imprint | - | - | - | - | - | - | - | - | - | | |
| | 10 | fabric | imprint | - | - | Z/2s | Z/2z | 14-12 | 10 | 0.78 | 0.78 | - | on a clay pot | |
| 3 | **Bieszków, Site -, Żary district**<br>hoard. HaD<br>Sikorski 2013<br>author of the analysis: Sikorski A.<br>unknown location of the material | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | tabby | Z/2s? | Z/2s? | 12 | 10 | 0.67 | 0.78 | - | on a bronze container | - |
| | 2 | cord | mineralized | plant | | z | - | - | - | 3.66 | - | - | inside a bead | hemp? |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **4** | **Biskupin, Site -, Żnin district**<br>settlement. HaC-D<br>Łaszczewska, without year<br>author of the analysis: Łaszczewska T.<br>the material is lost | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | - | - | 4 | 5 | 2.00 | 2.00 | - | on a daub | - |
| **5** | **Brzezie, Site 29, Pleszów district**<br>inhumation cemetery. IV EB-HaD<br>Pudełko 1997; Pudełko 1995<br>author of the analysis: -<br>material in District Museum of the Kalisz Region in Kalisz | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 300 | on an iron buckle | according to the author, a straight-weave linen fabric |
| | 2 | fabric | imprint | - | - | - | - | - | - | - | - | Grave 252 | on the bones, next to a bracelet | according to the author, the fabric is dense with a complicated weave |
| **6** | **Cząstków Polski, Site -, Nowy dwór Mazowiecki district**<br>inhumation cemetery. EB-Ha<br>unpublished<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | plant? | tabby | z | z | 6 | 5 | 1.04 | 0.92 | Grave 2 | - | - |
| **7** | **Domaradz, Site -, Namysłów district**<br>inhumation cemetery. Ha<br>Sage 1932; Antosik, Słomska 2014<br>author of the analysis: Sage G.<br>the material is lost | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | flax | tabby | s | s | 6 | 6 | 0.50 | 0.50 | Grave ? | on an iron bracelet | - |
| **8** | **Domasław, Site 10/11/12, Wrocław district**<br>cemetery. HaC-D<br>Maik, Rybarczyk 2016<br>author of the analysis: Maik J.<br>material in Institute of Archaeology and Ethnology Polish Academy of Science in Wroclaw | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | tabby | z | z | - | - | 0.30-0.40 | 0.30-0.40 | Grave 283 | on an iron fitting and a bronze ring | - |
| | 2 | fabric | mineralized | - | twill 2/2 | z | z | - | - | 0.20-0.30 | 0.20-0.30 | Grave 283 | on an iron fitting and a bronze ring | - |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | fabric | mineralized | - | twill 2/2 | z | z | 12 | 11 | 0.50-0.70 | 0.70-0.80 | Grave 384 | on iron item | - |
| | 4 | fabric | mineralized | - | tabby | z | z | 20 | 12 | 0.40-0.60 | 0.40-0.60 | Grave 402 | on iron item | - |
| | 5 | fabric | mineralized | - | tabby | z | z | 20 | 12 | 0.50-0.70 | 0.60-0.90 | Grave 460 | - | - |
| | 6 | fabric | mineralized | flax? | tabby | z | z | 10 | 10 | 0.50-0.60 | 0.50-0.60 | Grave 521 | - | - |
| | 7 | fabric | mineralized | - | twill 2/2 | z | z | - | - | 0.50-0.60 | 0.50-0.60 | Grave 521 | - | - |
| | 8 | band? | mineralized | - | - | - | - | - | - | 1.00-1.50 | - | Grave 521 | on birch bark | small fragments of woven sticks (wicker?); 5 holes in a row visible on a fragment of bark; on the other side, organic mass adheres to the braid |
| | 9 | fabric | mineralized | - | tabby | z | z | 14 | 10 | 0.50-0.70 | 0.60-0.80 | Grave 1694 | on the iron element of a toiletry set | - |
| | 10 | fabric | mineralized | - | tabby | z | z | 14 | 10 | 0.60-0.80 | 0.60-0.80 | Grave 1849 | in ceramic urn | - |
| | 11 | fabric | mineralized | - | tabby + half-basket or rep | z | z | 22 | 22 | 0.30-0.40 | 0.30-0.70 | Grave 4269 | on an iron object (pin?) | - |
| | 12 | fabric | mineralized | - | half-basket | z | z | 12-14 | 6-7 | 0.60-0.70 | 0.60-0.70 | Grave 5964 | on an iron object (pin?) | - |
| | 13 | fabric | mineralized | - | half-basket | S/2z | z | - | - | 1.00-1.20 | 0.70-0.80 | Grave 5970 | on iron item | - |
| | 14 | tablet woven band | mineralized | - | tablet-woven | S/2z | z | - | - | 1.00-1.30 | 0.70-0.80 | Grave 5970 | on iron item | - |
| | 15 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 6680 | on an iron chisel | - |
| | 16 | fabric | mineralized | - | twill 2/2 | z | z | 12-14 | 12-14 | 0.30-0.50 | 0.30-0.50 | Grave 6690 | on an iron bracelet | - |
| | 17 | fabric | mineralized | - | tabby | z | z | 14 | 8 | 0.50-0.60 | 0.50-0.60 | Grave 7464 | on an iron bracelet | - |
| | 18 | fabric | mineralized | - | tabby | z | z | 12 | 10 | 0.50-0.60 | 0.50-0.60 | Grave 8893 | in ceramic urn | - |
| | 19 | fabric | mineralized | - | tabby | z | z | 10 | 7 | 0.70-1.00 | 0.80-1.10 | Grave 8899 | on iron item | - |
| | 20 | fabric | mineralized | - | twill 2/2 | z | z | 14 | 14 | 0.40-0.60 | 0.60-0.80 | Grave 8943 | on a knife | - |
| | 21 | fabric | mineralized | - | twill 2/2 | z | z | 20 | 14 | 0.30-0.50 | 0.40-0.60 | Grave 8956 | on a knife | - |
| | 22 | fabric | mineralized | - | - | z | z | - | - | 0.30-0.40 | 0.30-0.40 | Grave 8963 | - | - |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23 | fabric | mineralized | - | tabby | z | z | 14 | 12 | 0.50-0.60 | 0.60-0.80 | Grave 10315 | on a knife | - |
| | 24 | fabric | mineralized | - | tabby | z | z | - | - | 0.50-0.60 | 0.70-0.80 | Grave 11622 | in ceramic urn | - |
| **9** | **Godziętów, Site 1, Ostrzeszów district**<br>inhumation cemetery. HaC<br>Zeylandowa 1972<br>author of the analysis: Słomska-Bolonek J.<br>material in Archaeological Museum in Poznań | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | wool | tabby | s | s | 22-24 | 12-14 | 0.35 | 0.35 | Grave 1 | on an iron bracelet | - |
| **10** | **Grabów, Site 1, Łęczyca district**<br>inhumation cemetery. Ha<br>unpublished<br>author of the analysis: Słomska-Bolonek J.<br>material in Museum in Piotrków Trybunalski | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | s | s | - | - | 0.70-0.80 | 0.80-0.90 | Grave 10 | in ceramic urn | - |
| | 2 | fabric | imprint | - | tabby | s | - | - | - | 1.10-1.20 | - | Grave 10 | | - |
| | 3 | fabric | imprint | - | tabby | s | s | - | - | 0.70-0.80 | 0.80-0.90 | Grave 10 | | - |
| **11** | **Jankowice, Site -, Oława district**<br>inhumation cemetery. Ha<br>Sage 1932<br>author of the analysis: Sage G.<br>material is lost | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | wool | tabby | s | s | 9 | 7 | 0.50 | 0.50 | Grave 1-4 | on an iron buckle | - |
| **12** | **Janówek, Site 1, Nowy Dwór Mazowiecka district**<br>inhumation cemetery. HaC/HaD<br>Słomska 2022<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archaeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | s | - | 8-9 | 3 | 1.20-1.30 | 1.40-1.60 | object 7A | in ceramic urn, in the bottom part | - |
| **13** | **Jarocin, Site 1, Jarocin district**<br>inhumation cemetery. HaC-HaD<br>Grygiel 1984; Przymorska-Sztuczka 2022<br>author of the analysis: -<br>location of material unknown | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | tabby | - | - | 7 | 7 | - | - | Grave 8 | on a necklace | - |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **14** | **Kałdus, Site -, Chełmno district**<br>settlement. HaC-D<br>Przymorska-Sztuczka 2021<br>author of the analysis: -<br>material in Instytut Archaeologiczny Uniwersytety Adama Mickiewicza | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | - | - | 14 | 14 | 0.12-0.17 | 0.12-0.17 | - | in ceramic vessel | blurred imprint |
| **15** | **Kamionka Nadbużna, Site -, Ostrów Mazowiecka district**<br>settlement. HaC-HaD<br>Węgrzynowicz 1973<br>author of the analysis: -<br>unknown location of material | | | | | | | | | | | | | |
| | 1 | fabric? | imprint | - | - | - | - | - | - | - | - | - | in ceramic vessel | - |
| **16** | **Kietrz, Site 1, Głubczyce district**<br>inhumation cemetery. HaC<br>Śliwa 1965; Antosik, Słomska 2014; Łaszczewska 1966<br>author of the analysis: Śliwa J.<br>material in Institute of Archaeology of the Jagiellonian University in Cracow | | | | | | | | | | | | | |
| | 1 | fabric | imprint | plant? | tabby | - | - | 18 | 18 | 0.30-0.50 | 0.30-0.50 | Grave 112 | on a glass bead | - |
| **17** | **Konin-Grójca, Site 1, Konin district**<br>stray find. VEB-HaC<br>Sikorski 2001<br>author of the analysis: Sikorski A.<br>material in District Museum in Konin | | | | | | | | | | | | | |
| | 1 | sprang | imprint | - | - | z | - | 14-16 | - | 0.10 | - | Grave? | on a necklace | Przymorska-Sztuczka repeated inspection of the material revealed no traces of textile material, I personally share this opinion |
| | 2 | sprang | imprint | - | - | s and z | - | - | - | 0.12 | - | | on a bracelet | |
| | 3 | sprang | imprint | - | - | s and z | - | - | - | 0.10 | - | | on a bracelet | |
| | 4 | sprang | imprint | - | - | Z | - | - | - | 0.12 | - | | - | |
| | 5 | sprang | mineralized | - | - | s and z | - | 16 | - | 0.12 | - | | on a pendant | |
| | 6 | sprang | mineralized | - | - | Z/2s | - | 10 | - | 0.12 | - | | on a bronze button | |
| | 7 | sprang | mineralized | - | - | Z/2s | - | 10 | - | 0.12 | - | | on a bronze button | |
| | 8 | thread | mineralized | - | - | Z/3s | - | - | - | 0.80 | - | | in the ear of a bronze button | |
| | 9 | sprang | imprint | - | - | - | - | - | - | - | - | | on a bronze button | |
| | 10 | sprang | mineralized | - | - | Z/2s | - | 4-5 | - | 0.27 | - | | on a bronze button | |
| | 11 | thread | mineralized | - | - | S/5s | - | - | - | 0.85 | - | | in the eyelet of a bronze button | |
| | 12 | sprang | mineralized | - | - | Z/2s | - | 4 | - | 1.00 | - | | on a bronze button | |

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| | 13 | sprang | imprint | - | - | z | - | 10 | - | 0.07 | - | | on a bronze button |
| | 14 | sprang | mineralized | - | - | Z/2s | - | 10-12 | - | 0.17 | - | | on a bronze button |
| | 15 | sprang | imprint | - | - | z | - | 10-11 | - | 0.15 | - | | on a bronze button |
| | 16 | sprang | mineralized | - | - | S/2z - Z/2s | - | 10-11 | - | 0.20 | - | | on a bronze button |
| | 17 | thread | mineralized | - | - | Z/4z | - | - | - | 1.25 | - | | on a bronze button |
| | 18 | sprang | imprint | - | - | s | - | 10 | - | 0.17 | - | | on a bronze button |
| | 19 | sprang | imprint | - | - | Z/2s | - | 10 | - | 0.30 | - | | on a bronze button |
| | 20 | sprang | mineralized | - | - | Z/? | - | 10 | - | 0.15 | - | | on a bronze button |
| | 21 | sprang | mineralized | - | - | Z/? | - | - | - | 0.15 | - | | on a bronze button |
| | 22 | thread | mineralized | - | - | Z/2z | - | - | - | 1.12 | - | | in the eyelet of a bronze button |
| | 23 | thread | mineralized | - | - | ?/3s | - | - | - | 1,00 | - | | in the eyelet of a bronze button |
| | 24 | sprang | mineralized | - | - | z | - | 16 | - | 0.07 | - | | on a bronze button |
| | 25 | thread | mineralized | - | - | S/3z | - | - | - | 0.71 | - | | in the ear of a bronze button |
| | 26 | sprang | imprint | - | - | z | - | 10-12 | - | 0.10 | - | | on a bronze button |
| | 27 | sprang | mineralized | - | - | S/2z | - | 10 | - | 0.45 | - | | on a bronze button |
| | 28 | sprang | mineralized | - | - | S/2z - Z/2s | - | 10-12 | - | 0.32 | - | | on a bronze button |
| | 29 | thread | mineralized | - | - | ?/2z; ?/3s | - | - | - | 1.12 | - | | in the eyelet of a bronze button |
| | 30 | sprang | mineralized | - | - | Z/3s | - | - | - | 0.77 | - | | on a bronze button |
| | 31 | thread | mineralized | - | - | Z/3s | - | - | - | 0.83 | - | | in the eyelet of a bronze button |
| | 32 | sprang | imprint | - | - | s | - | - | - | 0.10 | - | | on a bronze button |
| | 33 | sprang | mineralized | - | - | S/2z | - | 12 | - | 0.27 | - | | on a bronze button |
| | 34 | sprang | imprint | - | - | z | - | 10-12 | - | 0.15 | - | | on a bronze button |
| | 35 | sprang | mineralized | - | - | z and s | - | 8-10 | - | 0.12 | - | | on a bronze button |
| | 36 | sprang | mineralized | - | - | S/2s | - | 10-12 | - | 0.32 | - | | on a bronze button |
| | 37 | thread | mineralized | - | - | ?/3z and ?/2s | - | - | - | 1.50 | - | | in the eyelet of a bronze button |
| | 38 | sprang | imprint | - | - | Z/2s | - | 10 | - | 0.27 | - | | on a bronze button |
| | 39 | sprang | mineralized | - | - | Z/2s | - | 10 | - | 0.27 | - | | on a bronze button |
| | 40 | thread | mineralized | - | - | - | - | - | - | 0.75 | - | | in the eyelet of a bronze button |

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| | 41 | sprang | mineralized | - | - | S/2z | - | 10 | - | 0.30 | - | | on a bronze button | |
| | 42 | sprang | mineralized | - | - | Z/2s | - | 10 | - | 0.17 | - | | on a bronze button | |
| | 43 | thread | mineralized | - | - | Z/3s | - | - | - | 0.80 | - | | in the eyelet of a bronze button | |
| **18** | **Kosin, Site 2, Kraśnik district**<br>inhumation cemetery. IVEB-HaD<br>Miśkiewicz, Węgrzynowicz 1974<br>author of the analysis: -<br>location of material unknown | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | - | - | - | - | - | - | Grave 347 | in ceramic urn | - |
| **19** | **Lasowice Małe, Site -, Olesno district**<br>biritual cemetery. HaC-D<br>Dobrzańska, Gedl 1962<br>author of the analysis: von Stoker W.<br>material is lost | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | wool | tabby | z | z | 3 | 4 | 0.30-0.40 | 0.30-0.40 | Grave 29 | on a bronze button | alleged admixture of deer hair |
| **20** | **Łabędy-Przyszówka, Site 4, Gliwice district**<br>biritual cemetery. VEB-HaC<br>Dobrzańska-Szydłowska, Gedl 1962<br>author of the analysis: Antosik Ł., Słomska-Bolonek J., von Stoker W.<br>material analysed by W. von Stokera is lost. the rest in Upper Silesian Museum in Bytom | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 3 | on the skull bones | alleged admixture of deer hair |
| | 2 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 3 | on the skull bones | diadem, made of leather and wool |
| | 3 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 3 | - | under a diadem |
| | 4 | thread | mineralized | wool | - | Z/2s | - | - | - | 1.10 | - | Grave 3 | on the bones | - |
| | 5 | fabric | mineralized | plant? | - | - | - | - | - | - | - | Grave 5 | on the skull bones | - |
| | 6 | fabric | mineralized | - | - | z | z | - | - | - | - | Grave 9 | on the skull bones | - |
| | 7 | thread | mineralized | - | - | S/2z | - | - | - | - | - | Grave 9 | on the skull bones | - |
| | 8 | felt? | mineralized | wool | - | - | - | - | - | - | - | Grave 16 | on the skull bones | - |
| | 9 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 16 | - | under a bronze button - diadem |
| | 10 | fabric | mineralized | wool | tabby | - | - | - | - | - | - | Grave 19 | - | in the chest area, alleged admixture of deer hair |
| | 11 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 19 | | next to the skull bones |

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| | 12 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 32 | - | next to a bracelet |
| | 13 | felt? | mineralized | wool | - | - | - | - | - | - | - | Grave 33 | on the skull bones | - |
| | 14 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 33 | - | diadem |
| | 15 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 33 | on the skull bones | shroud? |
| | 16 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 33 | - | around the skull bones |
| | 17 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 33 | on the skull bones | - |
| | 18 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 33 | - | over a diadem |
| | 19 | thread | mineralized | wool | - | S/3z | - | - | - | 2.00 | - | Grave 33 | - | around the skull bones, thread from diadem |
| | 20 | felt? | mineralized | wool | - | - | - | - | - | - | - | Grave 39 | - | next to the skull bones |
| | 21 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 39 | on a bronze circle | next to the skull bones |
| | 22 | fabric | mineralized | wool | tabby | - | - | - | - | - | - | Grave 43 | - | in the chest area, alleged admixture of deer hair |
| | 23 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 43 | on a beaded necklace | - |
| | 24 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 43 | - | in the chest area |
| | 25 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 43 | on element of a diadem | - |
| | 26 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 43 | on element of a diadem | - |
| | 27 | thread | mineralized | - | - | - | - | - | - | 0.70 | - | Grave 43 | - | - |
| | 28 | fabric | mineralized | wool | tabby | - | - | - | - | - | - | Grave 46 | at a bracelet | - |
| | 29 | fabric | mineralized | plant? | - | - | - | - | - | - | - | Grave 65 | on the skull bones | - |
| | 30 | thread | mineralized | - | - | - | - | - | - | - | - | Grave 65 | - | - |
| | 31 | thread | mineralized | - | - | Z/2s | - | - | - | 0.50 | - | Grave 65 | on the skull bones | two fragments |
| **21** | **Maciejowice, Site 1, Garwolin district**<br>inhumation cemetery. IVEB-HaD<br>Maik 2014<br>author of the analysis: Maik J.<br>material in Institute of Archaeology and Ethnology of the Polish Academy of Science | | | | | | | | | | | | | |
| | 1 | fabric | imprint | flax? | tabby | s? | s? | 4-5 | 3-4 | 1.00 | 2.00-2.50 | Grave 137 | in ceramic urn, in the bottom part | - |
| | 2 | fabric | imprint | flax? | tabby | s? | s? | 5 | 4-5 | 0.70-1.00 | 0.70-1.00 | Grave 167 | | - |
| | 3 | fabric | imprint | flax? | tabby | s? | s? | 5 | 4 | 1.00 | 1.00 | Grave 247 | | - |
| | 4 | fabric | imprint | flax? | tabby | - | - | - | - | - | - | Grave 281 | | - |
| | 5 | fabric | imprint | flax? | rep | s? | s? | 8 | 4 | 0.50-0.60 | 1.00-1.50 | Grave 664 | | - |

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| | 6 | fabric | imprint | flax? | tabby | s? | s? | 4-5 | 4-5 | 0.80-1.00 | 1.00 | Grave 841 | | periodic change of weave to rep or weaving errors |
| | 7 | fabric | imprint | flax? | tabby | s? | s? | 8 | 7 | 0.80-0.90 | 1.00-1.20 | Grave 857 | | - |
| | 8 | fabric | imprint | flax? | tabby | s? | s? | 4-6 | 4-5 | 1.00-1.20 | 1.00-1.50 | Grave 860 | | - |
| | 9 | fabric | imprint | flax? | tabby | s? | s? | 6-7 | 4-5 | 0.60-1.00 | 1.50-2.00 | Grave 861 | | - |
| | 10 | fabric | imprint | flax? | tabby | s? | s? | 3-4 | 3-4 | 1.00 | 1.00 | Grave 876 | | - |
| | 11 | fabric | imprint | flax? | tabby | s? | s? | 5 | 4 | 0.80-1.00 | 1.00 | Grave 882 | | - |
| | 12 | fabric? | imprint | flax? | tabby? | s? | s? | - | - | - | - | Grave 911 | | - |
| | 13 | fabric | imprint | flax? | tabby | s? | s? | 7 | 6 | 0.60 | 0.90 | Grave 959 | | - |
| | 14 | fabric | imprint | flax? | tabby | s? | s? | 8 | 6 | 0.50-0.60 | 0.60 | Grave 1056 | | - |
| **22** | **Masłowice, Site 2, Wieluń district**<br>settlement. IIIEB<br>Antosik 2010<br>author of the analysis: Antosik Ł.<br>material in Museum of the Wieluń Land in Wielun | | | | | | | | | | | | | |
| | 1 | fabric? | imprint | - | tabby? | - | - | - | - | 0.50 | 0.50 | - | in ceramic vessel | - |
| **23** | **Mąkolice, Site 3, Piotrków Trybunalski district**<br>inhumation cemetery. HaC-D<br>Maik 1994<br>author of the analysis: Maik J.<br>material in Museum in Piotrków Trybunalski | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | half-basket | z | z | 12 | 7 | 0.63 | 0.84 | Grave 109 | on an iron ring | - |
| **24** | **Mirakowo-Grodno, Site 6, Toruń district**<br>settlement. VEB-HaC<br>Przymorska-Sztuczka 2022<br>author of the analysis: Przymorska-Sztuczka M.<br>material in Institute of Archaeology of the Nicolaus Copernicus University in Toruń | | | | | | | | | | | | | |
| | 1 | cord | mineralized | linden bast? | - | Z/3s | - | - | - | 0.30-0.40 | - | - | - | - |
| | 2 | cord | imprint | - | - | - | - | - | - | - | - | - | - | according to the author, the cord was made from plant material or tendons |

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| **25** | **Opatów, Site 1, Kłobuck district**<br>inhumation cemetery. IIIEB-HaC<br>Moskal-del Hoyo, Badal Garcia 2009<br>author of the analysis: Moskal-del Hoyo M., Badal Garcia E.<br>material in Institute of Archeology and Ethnology of the Polish Academy of Science in Cracow | | | | | | | | | | | | | |
| | **1** | thread | mineralized | animal intestines or tendons | - | - | - | - | - | - | - | Grave 1395 | on element of a diadem | - |
| **26** | **Pawełki, Site 7, Lubliniec district**<br>cemetery. HaC-D<br>Młodkowska-Przepiórkowska 2007; Młodkowska-Przepiórkowska 2010<br>author of the analysis: Królikowska-Pataraja K.<br>material in Museum in Częstochowa | | | | | | | | | | | | | |
| | **1** | thread | mineralized | animal intestines or tendons | - | s | - | - | - | 1.50-1.80 | - | Grave 1 | on a leather strap that is part of the diadem | - |
| | **2** | thread | mineralized | animal intestines or tendons | - | s | - | - | - | 1.80 | - | Grave 1 | | |
| **27** | **Piasek, Site -, Lubliniec district**<br>biritual cemetery. VEB-HaC<br>Reyman 1928; Jażdżewski 1932<br>author of the analysis: -<br>material is lost | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 8 | on a bronze button | - |
| | 2 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 9 | on bronze items | - |
| | 3 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 18 | - | under the necklace |
| | 4 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 19 | on a bronze item | around skull bones |
| | 5 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 19 | on a bronze item | around skull bones |
| | 6 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 19 | on a brozne items | - |
| | 7 | fabric? | mineralized | - | - | - | - | - | - | - | - | Grave 46 | - | around skull bones |
| | 8 | thread | mineralized | - | - | - | - | - | - | - | - | Grave 60 | - | around skull bones |

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| **28** | **Przeczyca, Site 1, Zawiercie district**<br>biritual cemetery. HaC<br>Szydłowska 1972<br>author of the analysis: Słomska-Bolonek J.<br>material in Upper Silesian Museum in Bytom | | | | | | | | | | | | | |
| | 1 | thread | mineralized | plant | - | - | - | - | - | 0.42 | - | Grave 357 | - | - |
| **29** | **Rosko, Site 47, Czarnków Trzcianka district**<br>hoard. VEB-HaC<br>Sikorski 2006<br>author of the analysis: Sikorski A.<br>material in District Museum in Piła | | | | | | | | | | | | | |
| | 1 | sprang | imprint | - | - | Z/2s | - | 4-6 | - | 0.35 | - | - | on a bronze axe | Przymorksa-Sztuczka repeated inspection revealed no traces of textile material, I personally share this opinion |
| **30** | **Ruda Pabianicka, Site 1, Łódź district**<br>inhumation cemetery. HaD<br>Ząbkiewicz-Koszańska 1958; Łaszczewska 1966<br>author of the analysis: Łaszczewska T.<br>material in Archaeological and Ethnographic Museum in Łódź | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | tabby | - | - | 6 | 7 | 1.00 | 1.00 | Grave 75 | on the handle of an iron sickle | - |
| | 2 | fabric | imprint | flax? | tabby | s? | s? | 8 | 8 | 0.80 | 0.80 | stray find | in ceramic urn | - |
| | 3 | cord | mineralized | flax? | - | s | - | - | - | 2.50 | - | Grave 75 | on the handle of an iron sickle | - |
| **31** | **Sieniawa-Pigany, Site -, Przeworsk district**<br>inhumation cemetery. HaD<br>Różańska 1962<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | tabby | s | s | 18 | 8-9 | 0.85 | 0.95 | Grave 52 | on the bones | the weft is covered with warp threads |

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| **32** | **Słomów Kościelny, Site 1, Turek district**<br>inhumation cemetery. Ha<br>Różańska 1975<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | wool? | tabby | z | z | - | - | 0.33 | 0.35 | Grave 40 | on a bronze pin | fabric wrapped tightly |
| **33** | **Sługocinek, Site 13, Końskie district**<br>settlement. VEB-HaC<br>Krzyszowski, Sikorski 2010<br>author of the analysis: Sikorski A.<br>unknown location of material | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | z | z | 12 | 10 | 0.46 | 0.64 | object 381 | in ceramic vessel | - |
| **34** | **Stare Kolnie, Site -, Opole district**<br>inhumation cemetery. Ha<br>Sage 1932; Antosik, Słomska 2014<br>author of the analysis: Sage G.<br>material is lost | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | flax | tabby | s | s | - | - | 0.30 | 0.30 | Grave ? | on an iron ankle ring | - |
| | 2 | fabric | mineralized | flax | tabby | - | - | 8 | 4 | 0.50 | 0.50 | Grave ? | on an iron ankle ring | - |
| **35** | **Świbie, Site 16, Gliwice district**<br>biritual cemetery. HaC-D<br>Słomska, Antosik 2016; Słomska-Bolonek, Antosik 2022<br>author of the analysis: Antosik Ł., Słomska-Bolonek J.<br>material analise by Łaszczewska T. is lost. the rest in Museum in Gliwice | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 14 | - | - |
| | 2 | fabric | mineralized | plant | tabby | z | z | - | - | 0.20 | 0.20 | Grave 14 | - | - |
| | 3 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 14 | - | under the pin |
| | 4 | thread | mineralized | plant | - | - | - | - | - | - | - | Grave 14 | on a bead | |
| | 5 | thread | mineralized | plant | - | - | - | - | - | 0.90 | - | Grave 14 | on a bronze button | - |
| | 6 | thread | mineralized | plant | - | z | - | - | - | 0.90 | - | Grave 14 | on a bronze button | - |
| | 7 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 14 | on a bronze button | - |
| | 8 | thread | mineralized | plant | - | - | - | - | - | - | - | Grave 19 | - | - |
| | 9 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 73 | on a diadem | connected to the leather |
| | 10 | thread | mineralized | plant | - | - | - | - | - | - | - | Grave 73 | - | connected to the leather |

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| | 11 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 76 | on an iron ankle ring | on the inside |
| | 12 | fabric | mineralized | plant | tabby | z | z | - | - | - | - | Grave 81 | on the skull bones | - |
| | 13 | fabric | mineralized | wool | tabby | z | z | 10-12 | 6-8 | 0.85 | 0.85 | Grave 81 | on an iron bracelet | on the outside |
| | 14 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 94 | on a necklace | - |
| | 15 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 94 | on the bones | - |
| | 16 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 97 | on the bones | - |
| | 17 | fabric | mineralized | - | tabby? | z | z | - | - | 0.90 | 0.80 | Grave 102 | on an iron ankle ring | on the outside |
| | 18 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 124 | on an bronze ankle ring | - |
| | 19 | sprang | mineralized | wool | - | z | - | - | - | 0.40 | - | Grave 124 | on wood | weakly twisted yarn |
| | 20 | fabric | mineralized | wool | tabby | S/2? | S/2- | 13 | 8-9 | 0.40 | 0.40 | Grave 125 | on wood | combined with fabric no. 21 |
| | 21 | fabric | mineralized | wool | - | z | z | - | - | - | - | Grave 125 | on wood | combined with fabric no. 20 |
| | 22 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 125 | on a brown bracelet | connected to the leather |
| | 23 | fabric | mineralized | plant | tabby | z | z | - | - | - | - | Grave 125 | on an bronze ankle ring | - |
| | 24 | fabric | mineralized | wool | tabby | S/2- | S/2- | 20-22 | 8-9 | 0.40-0.50 | 0.40-0.50 | Grave 125 | - | two colours of yarn visible. presumably red and blue; combined with fabric no. 26 |
| | 25 | fabric | mineralized | wool | tabby | z | z | 12 | 6 | 0.70 | 0.70 | Grave 125 | - | - |
| | 26 | fabric | mineralized | wool | tabby | z | z | 16-18 | 7 | 0.70 | 0.50 | Grave 125 | - | combined with fabric no. 24 |
| | 27 | fabric | mineralized | wool | tabby | z | z | - | - | 0.50-0.60 | 0.50-0.60 | Grave 125 | - | - |
| | 28 | fringe | mineralized | wool | - | z | - | 2-3 | - | 3.00 | - | Grave 125 | - | - |
| | 29 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 125 | bronze circle | part of diadem |
| | 30 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 128 | - | - |
| | 31 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 128 | bronze circle | part of diadem |
| | 32 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 129 | on leather | - |
| | 33 | thread | mineralized | plant | - | - | - | - | - | - | - | Grave 129 | on leather | - |
| | 34 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 136 | - | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 35 | sprang | mineralized | wool | - | z | - | - | - | 0.30 | - | Grave 136 | on wood | weakly twisted yarn |
| | 36 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 136 | - | - |
| | 37 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 141 | on an bronze greave | - |
| | 38 | fabric | mineralized | plant | tabby | - | - | - | - | - | - | Grave 141 | on diadem | - |
| | 39 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 141 | on diadem | - |
| | 40 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 141 | on diadem | - |
| | 41 | fabric | mineralized | wool | tabby | z | z | - | - | - | - | Grave 143 | on an bronze greave | - |
| | 42 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 151 | on the necklace | - |
| | 43 | fabric | mineralized | wool? | tabby | z | z | - | - | - | - | Grave 159 | on an iron bracelet | - |
| | 44 | fabric | mineralized | - | tabby | z | z | - | 6 | 1.00 | 1.00 | Grave 164 | on an iron ankle ring | on the inside |
| | 45 | fabric | mineralized | - | tabby | z | - | 10 | 8 | 1.10 | - | Grave 170 | on an iron bracelet | on the outside |
| | 46 | fabric | mineralized | wool | tabby | z | z | 8-10 | 6-8 | 1.10 | 1.05 | Grave 170 | on an iron bracelet | on the outside |
| | 47 | fabric | mineralized | wool | tabby | z | z | 12 | 6 | 1.20 | 1.05 | Grave 170 | on an iron bracelet | on the outside |
| | 48 | fabric | mineralized | - | tabby | z | z | 12 | 6 | 1.05 | 0.95 | Grave 209 | on an iron ankle ring | on the inside |
| | 49 | braided ribbons | mineralized | plant | - | z | - | - | - | 1.20 | - | Grave 209 | on an iron ankle ring | on the outside |
| | 50 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 221 | on the skull bones | - |
| | 51 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 228 | on the bones | - |
| | 52 | fabric | mineralized | wool? | - | z | z | - | - | 0.40 | 0.40 | Grave 231 | on wood | - |
| | 53 | fabric | mineralized | wool | tabby | z | z | - | - | 0.20-0.30 | 0.20-0.30 | Grave 231 | on wood | - |
| | 54 | fabric | mineralized | wool? | - | - | - | - | - | - | - | Grave 241 | on the skull bones | on the outside |
| | 55 | fabric | mineralized | - | tabby | z | z? | 10 | 9 | 0.95 | 0.90 | Grave 241 | on an iron ankle ring | on the outside |
| | 56 | fabric | mineralized | - | - | z | - | - | - | - | - | Grave 257 | on an iron ankle ring | on the outside |
| | 57 | fabric | mineralized | wool? | - | - | - | - | - | - | - | Grave 259 | on a bracelet | - |
| | 58 | fabric | mineralized | - | tabby | z | z | - | 8-10 | 0.80 | - | Grave 259 | on an iron ankle ring | on the inside |
| | 59 | fabric | mineralized | wool | tabby | - | - | 12-14 | 6-8 | 0.95 | - | Grave 259 | on an iron ankle ring | on the inside |

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| | 60 | fabric | mineralized | wool | tabby | z | z | 10-12 | 6 | 1.10 | 0.95 | Grave 259 | on an iron ankle ring | on the inside |
| | 61 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 271 | on an iron ankle ring | on the outside |
| | 62 | fabric | mineralized | wool | - | - | - | - | - | - | - | Grave 283 | on the necklace | - |
| | 63 | fabric | mineralized | - | tabby | z | - | - | - | 1.10 | - | Grave 283 | on an iron bracelet | on the outside |
| | 64 | thread | mineralized | plant | - | Z/2s | - | - | - | 0.90 | - | Grave 283 | on a bronze button | - |
| | 65 | braided ribbons | mineralized | plant | - | - | - | - | - | 1.00 | - | Grave 283 | on a bronze button | - |
| | 66 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 283 | - | - |
| | 67 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 283 | on a necklace | - |
| | 68 | fabric | mineralized | wool | - | z | z | - | - | 0.40 | - | Grave 344 | on the skull bones | on the outside |
| | 69 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 344 | on a necklace | - |
| | 70 | braided ribbons | mineralized | plant | - | - | - | - | - | 1.20 | - | Grave 344 | on diadem | - |
| | 71 | fabric | mineralized | - | tabby | z | z | 10 | 8 | 0.95 | 1.10 | Grave 347 | on an iron pin | on the outside |
| | 72 | fabric | mineralized | - | tabby | z | - | 12 | - | 0.95 | - | Grave 349 | on an iron ankle ring | on the outside |
| | 73 | fabric | mineralized | plant? | tabby | z | z? | 12 | 10 | 0.60 | 0.75 | Grave 350 | on the necklace | on the outside |
| | 74 | fabric | mineralized | - | - | z | z | - | - | - | - | Grave 354 | on the bronze bracelet | on the outside |
| | 75 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 391 | on the skull bones | - |
| | 76 | fabric | mineralized | - | tabby | z | - | - | - | - | - | Grave 395 | on an iron ankle ring | on the inside |
| | 77 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 395 | on an iron ankle ring | on the outside |
| | 78 | fabric | mineralized | - | - | z | z | - | - | - | - | Grave 395 | on an iron ankle ring | on the outside |
| | 79 | fabric | mineralized | plant? | tabby | z | z | 16 | 8-10 | 0.90 | - | Grave 395 | on an iron ankle ring | on the inside |
| | 80 | fabric | mineralized | - | tabby | z | z | 14-16 | 6 | 1.05 | - | Grave 395 | on a necklace | - |
| | 81 | fabric | mineralized | wool? | tabby | z | z | 12 | 10 | 0.80 | 0.70 | Grave 400 | on a bronze bracelet | on the inside |
| | 82 | fabric | mineralized | - | tabby | z | - | - | - | 0.90 | - | Grave 402 | on an iron ankle ring | on the outside |

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| | 83 | fabric | mineralized | wool? | tabby | z | z | - | | - | - | Grave 402 | on a bronze bracelet | - |
| | 84 | fabric | mineralized | - | tabby | z | z | 12 | 6 | 1.00 | - | Grave 402 | on an iron ankle ring | on the outside |
| | 85 | fabric | mineralized | plant | tabby | - | - | - | - | - | - | Grave 403 | on the bronze bracelet | - |
| | 86 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 403 | on an bronze ankle ring | on the outside |
| | 87 | fabric | mineralized | - | tabby | z | z | - | - | 0.85 | 0.85 | Grave 405 | on an iron pin | on the outside |
| | 88 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 412 | on the skull bones | - |
| | 89 | thread | mineralized | plant | - | S/2? | - | - | - | 1.10 | - | Grave 412 | on a bronze button | - |
| | 90 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 412 | on a bronze button | - |
| | 91 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | Grave 412 | on a bronze circle | - |
| | 92 | braided ribbons | mineralized | plant | - | - | - | - | - | 1.40 | - | Grave 418 | on a bronze button | - |
| | 93 | fabric | mineralized | wool? | tabby | z | z | 12 | 6 | 1,00 | 1.10 | Grave 449 | on an iron ankle ring | on the inside |
| | 94 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 449 | on an iron ankle ring | on the outside |
| | 95 | thread | mineralized | plant | - | Z/2s | - | - | - | 1.30 | - | Grave 449 | on a bronze button | - |
| | 96 | fabric | mineralized | plant | tabby | z | z | - | - | - | - | Grave 474 | on a bronze pin | - |
| | 97 | fabric | mineralized | wool? | tabby | z | z | 12-14 | 6 | 1.15 | - | Grave 474 | on an iron bracelet | on the outside |
| | 98 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 480 | on the skull bones | - |
| | 99 | thread | mineralized | plant | - | z | - | - | - | - | - | Grave 480 | on the skull bones | - |
| | 100 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 500 | on a diadem | - |
| | 101 | fabric | mineralized | - | tabby | z | z | 10-12 | 6 | 0.85 | 0.65 | Grave 511 | on a bronze ankle ring | on the outside |
| | 102 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 546 | on an iron ankle ring | on the outside |
| | 103 | fabric | mineralized | - | - | z | z | - | - | 1.15 | - | Grave 554 | on an iron bracelet | on the outside |
| | 104 | fabric | mineralized | plant | tabby | - | - | - | - | - | - | Grave 574 | on a bracelet | - |
| | 105 | fabric | mineralized | plant | tabby | - | - | - | - | 0.20 | - | Grave 574 | on an iron ankle ring | - |
| | 106 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 574 | on an iron ankle ring | - |

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| | 107 | fabric | mineralized | plant | - | - | - | - | - | - | - | Grave 576 | on an iron ankle ring | - |
| | 108 | fabric | mineralized | plant | - | - | - | - | - | 0.85 | 0.85 | Grave 576 | on an iron ankle ring | - |
| | 109 | braided ribbons | mineralized | plant | - | - | - | - | - | - | - | - | - | - |
| | 110 | sprang | mineralized | wool | - | - | - | - | - | - | - | Grave 14 | on bronze circle | - |
| **36** | **Teklin, Site -, Otwock district**<br>hoard. HaD<br>Węgrzynowicz 1966; Bender-Jørgensen 1992<br>author of the analysis: Bender-Jørgensen L., Słomska-Bolonek J.<br>material in State Archaeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | fabric or selvedges | imprint | - | half-basket or rep | z | z | 21 | 5 | - | - | - | on an iron object (knife) | - |
| | 2 | fabric | imprint | - | tabby | s | s | 16 | 6 | 0.37 | 0.27 | stray find | on iron item | 2 cm wide, probably part of a diadem |
| | 3 | fabric/ tablet-woven band? | - | - | - | - | - | - | - | - | - | - | on iron item | |
| | 4 | fabric/ tablet-woven band? | - | - | - | - | - | - | - | - | - | - | on iron item | |
| **37** | **Wierzawice, Site 18, Leżajsk district**<br>cemetery. HaC<br>Ormian, Wróbel 2007<br>author of the analysis: -<br>location of material unknown | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | - | - | - | - | - | - | - | - | Grave 260 | on a bronze bracelet | Infans II |
| | 2 | thread | mineralized | - | - | - | - | - | - | - | - | Grave 260 | in the eyelet of a bronze button | Infans II |
| **38** | **Wicina, Site 1, Żary district**<br>settlement VEB-HaC<br>Sikorski 2011<br>author of the analysis: Sikorski A.<br>material in Museum of the Lubuskie Region in Zielona Góra | | | | | | | | | | | | | |
| | 1 | fabric? | mineralized | - | tabby? | z | z | 10 | 8 | 0.49 | 0.67 | - | on a bronze button | - |
| | 2 | fabric? | mineralized | - | tabby? | z | z | 10 | 8 | 0.60 | 0.68 | - | on a bronze button | - |
| | 3 | fabric? | mineralized | - | tabby? | z? | z? | 10 | 8 | 0.37 | 0.48 | - | on a bronze button | - |
| | 4 | fabric? | imprint | - | tabby? | z | z | 12 | 10 | 0.34 | 0.50 | - | on a chain | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | fabric? | mineralized | - | tabby? | z | z | 12-14 | 10 | 0.35 | 0.41 | - | on a pin | - |
| | 6 | fabric | mineralized | - | tabby | z | z | - | - | 0.41 | 0.49 | - | on an axe | - |
| **39** | **Wołów, Site -, Wołów district**<br>inhumation cemetery. Ha<br>Sage 1932<br>author of the analysis: Sage G.<br>material is lost | | | | | | | | | | | | | |
| | 1 | fabric | mineralized | wool | tabby | s? | s? | - | - | 0.50 | 0.50 | Grave 1-4 | on an iron pin | remnants of the cover |
| **40** | **Zakrzew Site 3, Sieradz district**<br>inhumation cemetery. HaD<br>Maik 2005<br>author of the analysis: Maik J.<br>location of material unknown | | | | | | | | | | | | | |
| | 1 | tablet woven band | mineralized | - | tablet-woven | S/2z | s | 8-9 | 4-5 | 1.00-1.20 | 0.60-0.70 | Grave 289 | on an iron sickle | the warp threads completely cover the weft |
| | 2 | cord | mineralized | - | - | S/4z | - | - | - | 2.20-2.40 | - | Grave 267 | on a brown bead | - |
| **41** | **Żelazo, Site 50, Słupsk district**<br>hoard. HaC-HaD<br>Krzysiak 2006<br>author of the analysis: -<br>material in Museum in Lębork | | | | | | | | | | | | | |
| | 1 | cord | mineralized | - | - | - | - | - | - | - | - | - | in the socket of an axe | - |
| | 2 | cord | mineralized | - | - | - | - | - | - | - | - | - | | - |
| | 3 | cord | mineralized | - | - | - | - | - | - | - | - | - | | - |
| **42** | **Żdżenice, Site -, Turek district**<br>cemetery. IVEB<br>Janowski 1958<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archaeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | cord | mineralized | plant? | - | - | - | - | - | 2.60 | - | Tumulus 60/III | on a bronze item | knot |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **43** | **- unknow**<br>stray find. EB-Ha<br>unpublished<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archaeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | fabric | imprint | - | tabby | z | z | 14 | 10-12 | 0.25 | 0.22 | stray find | on the bronze bracelet | - |
| **44** | **- unknow**<br>biritual cemetery. HaC<br>unpublished<br>author of the analysis: Słomska-Bolonek J.<br>material in State Archaeological Museum in Warsaw | | | | | | | | | | | | | |
| | 1 | thread | mineralized | plant | - | - | - | - | - | 0.42 | - | Grave 357 | - | - |

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